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Solem, Michael

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Geography education, primary and secondary: international perspectives

Michael Solem

American Association of Geographers, USA

Sirpa Tani

University of Helsinki, Finland

Aims, scope, and positioning of geography in school curricula

The magnificent diversity of Earth's cultures and environments is fully evident in the many expressions of geography in school curricula around the world. Although the fundamental concepts and principles that make geography a spatial and ecological science are generally shared across borders, the world's nation-states have set their own priorities as to what, when, and how the subject is taught to school children. Consequently, geography is a school subject that shows little conformity from place to place in terms of expectations of what students should know and be able to do as an outcome of their primary and secondary education.

In the United States, for example, geography is strongly aligned with the social sciences (history, economics, civics, and philosophy), whereas students in countries such as Japan and Finland study geography more as a natural and environmental science. In other parts of the world, such as in England, geography has a curricular

association with the humanities. Much of this variation can be attributed to the fact that, like other subject areas (and especially in the social sciences), the content and status of geography in the curriculum is susceptible to external influences and vicissitudes in public opinion, economic conditions, political governance, and environmental change. This influence is most often felt in the content of the subject's national curriculum standards.

In the following sections, selected countries are profiled to illustrate the range of curricular traditions that geography has experienced internationally as a school subject.

United States

Since 1994, the United States has had voluntary national standards for geography that set benchmarks for geographic learning at the 4th, 8th and 12th grades. Published in the volume *Geography for Life* and most recently updated in 2012, the 18 US national geography standards specify expectations for student learning in six domains of knowledge: the world in spatial terms, places and regions, human systems, physical systems, environment and society, and the uses of geography. In a nutshell, the purpose of school geography in the United States is to develop a geographically informed person – “someone who sees meaning in the arrangement of things on the earth's surface, who sees relations between people, places, and environments, who uses geographic skills, and who applies spatial and ecological perspectives to life situations” (Heffron and Downs 2012, 7).

Because of the voluntary nature of national curriculum standards in the United States, states

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determine the goals of the curriculum, the instructional materials used to support implementation of those goals, and the assessments designed to measure student attainment. Forces ranging from economic globalization and global environmental change, to political calls for national educational reform and accountability, and an utter lack of federal funding appropriations for geography, have all contributed to the waxing and waning of the subject in US schools (Bednarz, Heffron, and Solem 2014).

As of 2015, at either the middle school (grades 6–8) or high school (grades 9–12) level, geography may be present as a strand within social studies standards or as a separate set of standards (sometimes paired with history), often linked to a course (McClure and Zadrozny 2015). In the elementary grades (K–5), geography is mostly integrated with the social studies. At the middle school level, nine states require a stand-alone geography course, and four states offer a combined geography/social studies course. At the high school level, four states require a stand-alone geography course, six states offer a combined geography/social studies course, and geography is an optional course for graduation in four states.

Europe

There is tremendous diversity in school geography requirements across Europe. Some of the significant differences and experiences are highlighted here. In England, geography is compulsory in years 5–14 with optional courses of study in subsequent years. As stated in a report to the International Geographical Union (Brooks and Catling 2014), the aim of the national curriculum for geography in primary education carries an affective component (to inspire curiosity and fascination about the world) as well

as a content dimension, which calls for students to become knowledgeable about people, places, and resources, as well as physical and human environments and processes. Through their learning of geography and applications of map skills and field methods, students are expected to develop locational knowledge, including the human and physical features and characteristics of places, as well as the spatial interactions and interdependence of places and how these can change over time. In secondary schools the emphasis shifts to the study of where places are, how places and landscapes are formed, how people and their environment interact, and how a diverse range of economies, societies, and environments are interconnected.

Nordic countries offer an interesting comparison with England and the United States, but even there the differences can be remarkable. As in the United States, school geography in Sweden is classified as a social science. In grades 1–3, geography is a subject integrated with social studies. In later years through lower secondary school, geography is an independent subject, but by upper secondary school it is no longer a compulsory subject. In contrast, Finland's national curriculum has positioned geography as an integrated subject “environmental and natural studies” (combined with biology, chemistry, physics, and health education) during the first four years in primary schools. During grades 5 and 6, geography is integrated with biology (Tani 2014). In the updated version of the national framework curriculum, geography will be taught as part of environmental studies through the six years of primary school from 2016. In lower secondary school (grades 7–9), geography is studied as an individual subject and is mandatory for all students. Both in primary and in lower secondary schools, the tradition of regional geography has remained strong. In upper secondary schools, students have had

two mandatory courses in geography (one in physical geography, one in human geography). In addition to these two courses, every school in Finland offers two extra courses, one on hazards and another on regional studies. The Finnish national curriculum will also be updated and implemented in 2016 in upper secondary schools. It has been decided that geography will have only one mandatory and three voluntary courses in the future.

Continental Europe exhibits even more variation in geography education. Primary geography education in the Netherlands (4–12 years old) is taught alongside history and biology under the guise of a “world orientation” curriculum. In lower secondary education (12–15 years old), geography is taught as a separate subject on par with the hours dedicated for science education (but less than given to languages, arts, and mathematics). The content focuses heavily on human–environment relationships. In neighboring Germany, geography education bears a resemblance to the situation in the United States, with geography’s position in the curriculum varying significantly between different federal states. Some states within Germany promote a regional geography (most commonly environmental and physical geography), while thematic issues and topics are the focus in others. In Germany’s upper secondary schools, geography is affiliated with the social sciences in all of the federal states.

Asia

The status of geography education in Asia is also highly variable. In some Asian countries, requirements for school geography are on par or exceed those in Western societies. Elsewhere, it is difficult to find even cursory attention given to geography education.

Formal geography education in India is generally neglected in schools. Where it is taught, geography is characterized by a highly didactic pedagogy, with little, if any, exploratory learning. In all but the most prestigious international schools and private schools, students are tasked with rote learning and memorizing disparate facts; little emphasis is given to teaching critical thinking and application skills. The state does not provide for teachers to deliver geography education that develops practices of analysis, application, and communication. For these reasons, an informal education sector has emerged to provide alternative educational experiences for youth and professional development opportunities for teachers across India (Solem and Balanchandran 2013).

The geography content in Japan’s primary and secondary schools is influenced by the government’s interest in promoting safety and awareness of natural hazards (Ohnishi and Mitsuhashi 2013). In high school geography, on the topic of natural environment, students learn about the geomorphological features of Japan and the ways Japanese cities and towns have worked to engineer the built environment to reduce the adverse impacts of earthquakes, tsunamis, landslides, and other natural disasters. Students learn the geographic features of the natural environment of Japan and their relationships to natural disasters and human responses to disasters. Students also study how human–environment interactions with regard to natural disasters vary across different regions in Japan, often by completing activities that make use of data, maps, and other geographic representations.

In Singapore, the national curriculum in geography from primary to pre-university level is described by a national syllabus document (Chang 2014). Geography is taught as part of an integrated social studies course at the primary level. At the lower secondary level, geography

is a compulsory subject, while it is an elective subject at the upper secondary and pre-university levels. One distinctive element of Singapore's national syllabus document is the inclusion of desired outcomes of education (DOE), which are a broad set of attributes that define the aims of school education. Subject teachers are expected to correlate syllabus content and instructional methods with the four-part DOE, which are: (i) a confident person who has a strong sense of right and wrong, is adaptable and resilient, knows himself, is discerning in judgement, thinks independently and critically, and communicates effectively; (ii) a self-directed learner who takes responsibility for his own learning, who questions, reflects, perseveres in the pursuit of learning; (iii) an active contributor who is able to work effectively in teams, exercises initiative, takes calculated risks, is innovative and strives for excellence; and (iv) a concerned citizen who is rooted to Singapore, has a strong civic consciousness, is informed, and takes an active role in bettering the lives of others around him.

At grades 9 and 10, students in Singapore take the Singapore – Cambridge General Certificate of Education (Ordinary Level) Examination. During these grades students take a mandatory combined humanities syllabus, which is organized around two core ideas – “being rooted” and “living global.” The twin core ideas are delivered through six themes reflecting the topics from disciplines such as history, geography, political science, sociology and economics. The O-level geography elective syllabus is structured around three major themes: “our dynamic planet”, “our changing world” and “geographical skills and investigations.” The physical geography topics span plate tectonics, geomorphology, weather and climate, natural vegetation, and rivers and coasts. The human geography topics include agriculture, industry, tourism, and economic development.

Teacher education in geography

United States

Just as the fifty US states set their own school geography standards, so, too, do teacher certification requirements vary from state to state (Heffron 2013). Most colleges and universities offer an accredited teacher education program. At some institutions, pre-service teachers enroll in an academic degree program (subject major) at the same time they complete instructional methods coursework in the teacher education program. Other institutions require students to complete a traditional four-year undergraduate major followed by a fifth-year or master's teacher preparation course of study. In either format, pre-service teachers are usually expected to complete a teaching practicum in a local school. Only a handful of US teacher education programs offer pedagogy courses specifically for geography.

Chronic teacher shortages and high rates of teacher attrition have led to so-called alternative teacher certification programs. These programs are aimed at practicing professionals who are interested in a career change to K-12 teaching. Alternative certification options are now available in nearly every state.

Europe

In Europe, the Bologna Declaration signed by the ministers of education in 29 countries in 1999 was designed to reform higher education systems in significant ways. Foremost among the changes was the adoption of systems of “easily readable and comparable degrees” at both the undergraduate and graduate levels, with the undergraduate (bachelor) level lasting normally three years and the graduate (master's) level for two years. In addition, the comparable system of credits (the ECTS system) was established. These

changes resulted in enhancing mobility for students, teachers, researchers, and administrative staff of higher education institutions.

Implementation of the Bologna Declaration has proven especially challenging for teacher education because of the great variation regarding its structure, length, and required qualifications. Major reasons for this can be found from the fact that teachers are employed in national education systems, which can vary not only between the countries but also nationally. Bauer and Prenzel (2012) have shown, however, that despite this variation most of the countries that have signed the Bologna Declaration now have teacher education delivered in tertiary institutions, most often in universities. Some countries (e.g., Denmark, Hungary, Italy, and Luxembourg) have shifted their teacher education systems to the university level during the Bologna process and 38% of all the Bologna countries now require a master's degree for at least all secondary teachers. Moreover, 20 countries have established new national standards and guidelines for teacher education (Bauer and Prenzel 2012, 1642).

The following examples, adapted from a report prepared for the GeoCapabilities initiative (Tani 2015), illustrate these diverse trends and patterns in European teacher education.

In the Flemish region of Belgium, teacher education for primary and lower secondary school is provided by professional bachelor institutions. At the lower secondary school level, students are required to select two subjects (e.g., geography and mathematics) and study a program that includes general courses on pedagogy, specific courses on subject education (subject didactics), and a third-year internship. For qualification at the upper secondary education level, students generally concentrate in a major subject and enroll in courses and internships leading to a master's degree.

In England, becoming a qualified teacher once only required a course of study consisting of a three-year bachelor's degree followed by a one-year postgraduate certificate of education (PGCE). That model has been criticized on grounds that the separation of subject content and pedagogical instruction made it too difficult for teachers to link theory, knowledge, and practice. This led to the introduction of alternative pathways to teacher preparation. As of 2014 in England, there are four major routes toward qualification.

- 1 The PGCE is one-year postgraduate certificate normally carrying 60 master's level credits. The program is university-led and organized in partnership with local schools, in which trainee teachers spend around 60% of their time – usually in two blocks of teaching practice in two different schools.
- 2 “Teach First” is a one-year program starting with an intensive “summer school” before participants are allocated to often very challenging schools where they teach a heavy timetable from the start. Teach First, run by the independent body in partnership with universities, is designed to attract high performing and often very ambitious young graduates who are encouraged to see themselves from the start as “leaders.”
- 3 “School Direct” was introduced by the coalition government of 2010. From the trainees' point of view it is almost identical to the PGCE, except he or she applies and is given a training place directly by a school. This is seen as a measure to wrest control from the universities, but it has had a slow start and is seen as a threat to standards.
- 4 “School Direct” (salaried route) is a variation that diminishes even further the role of the university element in training: the trainee is employed by the school from the start. This

route is an attractive option for those considering a change of career to become a school teacher.

Finland's teacher education system for primary as well as lower and upper secondary schools is organized by universities. Students seeking to become qualified for these schools need to earn a master's degree. In primary school teacher education, the students study educational sciences as their major discipline, while in subject education (to be qualified for teaching in lower and upper secondary schools) the students will most often have two subjects. For example, almost all the geography student teachers have a combination of geography and biology in their degree; one of these is studied as a major and another one as a minor subject. Unlike in many parts of the world, the teaching profession carries a good amount of social prestige and respect in Finland. This can be seen for example in the popularity of the studies: the intake in primary teacher education is only 10% of all applicants.

Teacher education for secondary schools in Germany is organized by the federal states; thus, there are a number of different approaches. Notwithstanding the differences, students are usually required to study two school subjects. In some federal states and universities one of these subjects has to be German, mathematics or a foreign language. In other federal states students can combine practically all subjects. This often leads to combined courses of study (e.g., physical education and geography). With the Bologna process teacher education became extremely diversified, making it a lot harder to move from one federal state to another. The reason for this is that some federal states did not change their teacher education system at all, but kept the Staatsexamen (wishing to keep state control over examinations). Others changed completely over to the Bologna system, but introduced

different undergraduate and postgraduate degree systems. Still others kept the old system, but introduced modularized studies so as to better combine teacher education courses with courses for academic geographers. Independent of the Bologna process, there is a move to integrate more pedagogy and more practical studies into the first phase of teacher training. This has led to an influx of non-academic educators at universities (thereby lowering the costs of teacher education) and a marked reduction in subject studies. At the moment there is also a major move towards integrating modules on inclusion into all teacher-training courses, which further reduces the time for subject studies.

In the Netherlands, pre-service teacher training programs for the various types of school are part of higher education, some being provided at institutions of higher professional education (HPO), and some at universities. There are full-time, part-time and dual (i.e., work-study) HPO teacher training courses. There are also full-time, part-time and dual university-based training courses leading to a grade one secondary school teaching qualification for all levels of secondary education, including pre-higher education. These courses are open to university students and graduates only. The HPO institutions provide teacher training at both bachelor's and master's level. Universities provide training at master's level only.

All teacher education in Sweden was integrated within the university/university college system in 1977. Two important changes on the structural level have affected the Swedish school system from the early 1990s. In 1991 there was reform which increased local autonomy for the municipalities and, secondly, a very open policy towards independent schools was introduced (1992). The first change meant that all teachers are employed by the municipalities or by independent schools. Government grants are given

but the system gives the municipalities or the independent school owners the right to decide on local priorities.

Since the social democratic government was replaced in 2006 by a center-right alliance, a massive reform program has been launched in the educational sector. Several new changes have been introduced to the school system, for example, a new education act (2011), new curricula (2011), new grading system (2011), and introduction of teacher certification (2013). Grading has been reintroduced in year 6 (2012), and national tests have been introduced in natural and social science subjects in years 6 and 9 (2013). In 2011, a new reformed system of teacher education was launched in Sweden. The previous common degree of Bachelor/Master of Education was replaced by four new professional degrees: pre-school education, primary school education, subject education, and vocational education.

Asia

India's teacher education system pays only cursory attention to geography, if any at all (Solem and Balanchandran 2013). With the teaching of geography being left to the discretion of teachers, it is becoming more and more an ancillary topic in many schools. Teachers have long felt unprepared to teach the subject due to inadequate training. In recent years, informal approaches to teacher education have emerged in an attempt to promote geography in schools and support schools that wish to include the subject in their curriculum. This work has largely been led by The Indian Institute of Geographical Studies through a regional network of GeoVidyaa Centres located at the Army Public School in Bangalore, Nirmala College in Coimbatore, and the Cascade Montessori Resource Centre in Chennai.

In Japan, certification for primary school teachers is relatively simple: the "primary education license" allows anyone to qualify for teaching practice at the primary level (Ida *et al.* 2015). In the teacher education curriculum in Japanese universities, almost all students select some specialty subject, such as mathematics, social studies, or comprehensive studies. Student teachers who wish to acquire a social studies teacher's certification must major in a social studies-related discipline, such as geography, history, and civics. This means that teachers who elect a discipline other than geography may require additional training and preparation to teach the geographical content of the curriculum (a situation which mirrors that of the United States).

The National Institute of Education at Nanyang Technological University in Singapore is that country's sole provider of a geography teacher education program. Initial teacher preparation in Singapore consists of three possible pathways: primary, secondary, and junior college. Each provides a foundation in pedagogy and specialized subject knowledge in at least one discipline. Programs offered include a two-year diploma in education (for primary education), a four-year bachelor of arts or science in education, and a 1–2 year postgraduate diploma in education. Components of the degrees include coursework in subject areas, education, language and communication, character development, and field experience (school practicum).

Research, curriculum and professional development resources

There are many international examples of resources, curriculum materials, conferences, and professional development programs for geography educators and researchers (Table 1).

Table 1 Selected international programs and resources for primary and secondary geography.

Resource	Website
<i>Research</i>	
IGU-CGE Declaration for Research in Geography Education. A statement advocating a research culture and agenda for improving the quality of geography educational practices internationally.	www.igu-cge.org
GeoCapabilities. A project researching the purposes and values of geography in schools.	www.geocapabilities.org
<i>Professional development</i>	
digital-earth.eu (EU). European project examining the use of geographical ICT in teacher education	http://www.eurogeography.eu/digital-earth-project/
iGuess (EU). Training teachers in the use of GIS for teaching multiple subjects.	www.iguess.eu
School on the Cloud (EU). Promoting digital citizenship through cloud-based educational applications in schools.	schoolonthecloud.eu/index/
I-Use (EU). A program supporting the teaching of statistics in different subject areas.	www.i-use.eu
Geo Vidyaacenters (India). A network of informal geography education and professional development providers.	http://www.tigs.in/geovidyaa-geography-centers/
Esri-ConnectED (US). An initiative to support the implementation of cloud-based GIS technology in schools.	www.esri.com/connected
Geography: Teaching with the Stars (US). A hybrid approach to preparing geography teachers through face-to-face workshops, videos, and online forums.	www.geoteach.org
<i>Publications</i>	
<i>International Research in Geographical and Environmental Education</i>	www.igu-cge.org/publications.htm
<i>Review of International Geographical Education Online</i>	www.rigeo.org
<i>Journal of Research and Didactics in Geography</i>	j-reading.org/index.php/geography

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One of the leading world organizations for primary and secondary geography education is the International Geographical Union's Commission on Geographical Education. The IGU-CGE sponsors conferences and symposia in different parts of the world, often in conjunction with the IGU Congress. The Commission is also pursuing a broad range of initiatives aimed at improving research capability and capacity, supporting international curriculum projects, an international geography Olympiad, and charters for geography education and sustainable development and cultural diversity.

National organizations such as the Geographical Association in the United Kingdom, the National Council for Geographic Education in the United States, and the Geographical Education Society of Japan offer professional memberships for primary and secondary teachers, teacher educators, and geography education researchers. Through their annual conferences, publications, and special projects, geography teacher associations such as these provide important opportunities for continuing education and professional development. Similarly, many of the professional associations listed in this Encyclopedia's appendix have internal specialty groups and task forces that focus on issues of primary and secondary education.

There is also growing international cooperation in the area of geography education research. One influential US report originated in 2013 called for broad-scale improvements in geography education research, including international collaborative research. That report, issued by National Geographic's Road Map for 21st Century Geography Education project (Bednarz, Heffron, and Huynh 2013), presented a research agenda framed by four key questions.

- 1 How do geographic knowledge, skills, and practices develop across individuals, settings, and time?

- 2 How do geographic knowledge, skills, and practices develop across the different elements of geography?
- 3 What supports or promotes the development of geographic knowledge, skills, and practices?
- 4 What is necessary to support the effective and broad implementation of the development of geographic knowledge, skills, and practices?

The road map project spawned subsequent research projects in the United States and also had an influence internationally. A National Center for Research in Geography Education, established in 2013 by the Association of American Geographers and Texas State University, is coordinating research activities of networks of geography and STEM education researchers affiliated with over 50 universities in the United States and several international institutions. Some of these initiatives involve research collaborations with universities abroad as well as with the state Geographic Alliances: GeoProgressions, a capacity-building project for learning progressions research, and GeoSTEM (GeoSpatial Teaching Enrichment Modules), a pilot project that is supporting the Esri-ConnectED initiative by creating ArcGIS online-based resources, materials, and tools for STEM teacher education programs.

The IGU Commission on Geographic Education is using the road map project report as a reference for designing an International Declaration on Research in Geography Education. This declaration, which was released in 2016, assesses the international need for more and better quality research in geography education. One multiyear research project, GeoCapabilities, is active in several countries across Europe, Asia, and North America. The project's research component is gathering evidence of how teachers in different countries understand the value of

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geographic knowledge and thinking in terms of its capacity for human development over the lifespan. As a leading example of an international comparative research project in geography education, GeoCapabilities may well offer a model for other disciplines to follow in researching the purposes and values of their subject in the context of primary and secondary education.

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SEE ALSO: Geography education: primary and secondary

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